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THREE-MICRON SPECTROSCOPY OF HIGHLY REDDENED FIELD STARS

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Broad absorption features centred at $3.45 \mu\text{m}$ and at $3.0-3.1 \mu\text{m}$ towards a number of late-type supergiants in the vicinity of the Galactic Centre have been repeatedly reported. Here, we present $2.0-2.5 \mu\text{m}$ and $3.0-4.0 \mu\text{m}$ spectra of field late-type highly reddened ($A_V \sim 17 - 27$) stars located in different regions of the galactic plane more than 20° away from the Galactic Centre direction. The observations, made with the 3.6m, 2.2m and 1.0m ESO telescopes at La Silla, Chile, consist of CVF spectra with resolution $\lambda/\Delta\lambda \simeq 100$ and IRSPEC spectra with resolution $\lambda/\Delta\lambda \simeq 700$. In the direction of the most highly reddened stars, definitive detections of the $3.45 \mu\text{m}$ and the $3.0-3.1 \mu\text{m}$ absorption features are reported. The $3.45 \mu\text{m}$ feature has been attributed to absorption arising in a vibrational transition resulting from the C-H stretching in organic compounds, while the $3.0-3.1 \mu\text{m}$ broader feature are tentatively attributed to O-H bonds. The observations strongly support that the agent producing the $3.45 \mu\text{m}$ feature, presumably organic molecules, is an important component of the diffuse interstellar medium and is not characteristic only of the Galactic Centre environment.